



1408.64941

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Kazuhiko Takaishi  
Serial No.: 09/713,578  
Conf. No.: 3276  
Filed: 11/16/2000  
For: HEAD POSITIONING CONTROL  
METHOD FOR A STORAGE DEVICE  
AND HEAD POSITIONING  
CONTROL DEVICE  
Art Unit: 2651  
Examiner: Wong, K.  
Patent: 6,995,944 B1  
Issued: Feb. 7, 2006

*I hereby certify that this paper is being deposited with the United States Postal Service as FIRST-CLASS mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this date.*

*18 Apr 2006*  
Date

Registration No. 29,367  
Attorney for Applicant(s)

**Certificate**  
**APR 27 2006**  
**of Correction**

**REQUEST FOR CERTIFICATE OF CORRECTION UNDER RULE 322**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450  
ATTN: Certificate of Corrections Branch

Dear Sir:

In accordance with 37 C.F.R. § 1.322, patentees, through their attorneys, respectfully request that a Certificate of Correction be issued in the above-referenced patent.

The errors occurred as a result of mistakes on the part of the Patent and Trademark Office and the changes include the following:

MAY 01 2006

On the Patent Face:

In the Abstract, line 3, delete second occurrence of “estimates” (§ 312 Amend. p. 3, line 2).

In the Abstract, line 5, after “control circuit” insert --and-- ” (§ 312 Amend. p. 2, line 4).

## REMARKS

A Certificate of Correction incorporating the delineated change is enclosed in duplicate herewith. Since the mistakes were on the part of the Patent and Trademark Office, a Certificate of Correction should be issued without expense to the patentee and such is respectfully requested.

Respectfully submitted,

GREER, BURNS & CRAIN, LTD.



By

Patrick G. Burns  
Registration No. 29,367

April 19, 2006

300 South Wacker Drive  
Suite 2500  
Chicago, Illinois 60606  
Telephone: 312.360.0080  
Facsimile: 312.360.9315

Customer No. 24978

MAY 01 2006

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.  
(Also Form PTO-1050)

## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : 6,995,944 <sup>B1</sup>  
DATED : Feb. 7, 2006  
INVENTOR(S) : Kazuhiko Takaishi

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

### On the Patent Face:

In the Abstract, line 3, delete second occurrence of "estimates".

In the Abstract, line 5, after "control circuit" insert --and--.

#### MAILING ADDRESS OF SENDER:

Patrick G. Burns  
GREER, BURNS & CRAIN, LTD.  
300 South Wacker Drive, Suite 2500  
Chicago, IL 60606

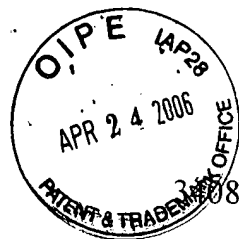
PATENT NO 6,995,944

No. of additional copies 1



Burden Hour Statement: This form is estimated to take 1.0 hour to complete. Time will vary depending upon the needs of the individual case. Any comment on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

MAY 01 2006



08.64941

# PATENT APPLICATION

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re U.S. Patent Application )

Applicant: Takaishi et al. )

Serial No. 09/713,578 )

Conf. No. 3276 )

Filed: November 16, 2000 )

For: HEAD POSITIONING CONTROL )

METHOD FOR A STORAGE )

DEVICE AND HEAD )

POSITIONING CONTROL )

DEVICE )

Art Unit: 2651 )

Examiner: Wong, K. )

*I hereby certify that this paper is being deposited with the United States Postal Service as FIRST-CLASS mail in an envelope addressed to: Mail Stop ISSUE FEE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this date.*

October 7, 2005

Date

F-CLASS.WCM

Appr. February 20, 1998

*Registration No. 47,954*

*Attorney for Applicant*

## AMENDMENT AFTER NOTICE OF ALLOWANCE UNDER 37 C.F.R. 1.312

Mail Stop ISSUE FEE  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

Prior to issuance of the above-named allowed Application, please enter the following amendments:

## IN THE SPECIFICATION:

Please replace the paragraph beginning on page 5, line 19, with the following new paragraph:

--(1) As shown in Fig. 56, the steady-state bias value not only changes depending on the position of the head, but that bias value also differs, even for the same track, depending on the where the head was located in the past. In other words, as shown in Fig. 56, it has ~~hysterisis~~-hysteresis characteristics. Therefore, in the prior method of using a bias table of average bias values, the shift in bias values is large. For example, for a 2.5-inch HDD, there is 1 to 3 mA error. Since this error cannot be estimated in advance, correction is not possible. Therefore, in a feedback control system in settling control, there must be time to correct this shift in bias value, and so there is the problem of not being able to shorten the settling time.--

Please replace the paragraph beginning on page 78, line 14, with the following new paragraph:

--(11) During ~~eøaree~~-coarse control, it is possible to estimate the bias value in real time, and estimate the real position and real velocity, and according to those values, switch from ~~eøaree~~-coarse control to settling control. The real velocity is estimated instead of the observer estimated position, and control is switched to settling control at that velocity. This makes it possible to avoid moving in the reverse direction, the velocity becoming 0, or never coming close to the target position.--

IN THE ABSTRACT:

Please replace the Abstract of the Invention with the following new Abstract:

--A head positioning method and device positions a head which reads a disk-type storage medium at a specified location, and accurately estimates a bias value during settling control. A disk device includes a disk medium, a head, an actuator, and a control circuit, and settling control is performed based on a detected position after coarse control without integral compensation or bias compensation having been performed. The position of the head for a next sample is estimated, and an initial bias value is estimated from the difference between the detected position and the estimated position. This initial bias value is then used to perform settling control together with integral compensation of bias compensation. Since the accurate initial bias value at the start of settling is estimated, it is possible to reduce the time for correcting the shift in the bias during settling control, and greatly reduce the time required for settling control.--

## REMARKS

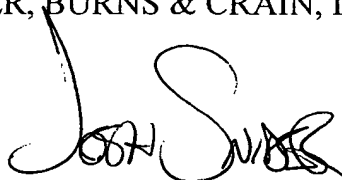
As a preliminary matter, Applicants have amended the Specification and the Abstract to the present allowed Application. The proposed amendments correct grammatical and/or typographical errors, and place the Application in better form for issuance. As such, the proposed amendments are merely formal in nature, do not introduce new matter, and do not affect the scope of the claims. Therefore, the proposed amendments are permissible under 37 C.F.R. 1.312. Accordingly, approval and entry of these amendments is respectfully requested.

Should the Examiner be of the opinion that further clarification is necessary, or that outstanding issues exist, the Examiner is invited to contact the undersigned attorney

Respectfully submitted,

GREER, BURNS & CRAIN, LTD.

By



Josh C. Snider

Registration No. 47,954

**Customer No. 24978**

October 7, 2005

300 South Wacker Drive

Suite 2500

Chicago, Illinois 60606

Telephone: (312) 360-0080

Facsimile: (312) 360-9315

P:\DOCS\3408\64941\9J8331.DOC